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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,987	09/30/2004	Dominique David	034299-604	2953

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EXAMINER	
MOFFAT, JONATHAN	
ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 09/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/509,987	DAVID ET AL.
	Examiner	Art Unit
	Jonathan Moffat	2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/12/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to because there are two different symbols used to represent comparators. If they are intended to be the same component it would be simpler for them to appear the same in the drawings. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions,

wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:
(1) if a machine or apparatus, its organization and operation;
(2) if an article, its method of making;
(3) if a chemical compound, its identity and use;
(4) if a mixture, its ingredients;
(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure is objected to because it should not be a reprinting of the first independent claim and the second to last line of the abstract should be part of the main body of the abstract. In addition the last line of the abstract is unnecessary. Correction is required. See MPEP § 608.01(b).

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Device for detecting orientation of a solid with measurement correction means.

Claim Objections

Claim1 objected to because of the following informalities: The words "at least" on line 5 in claim 1 should be deleted. In addition, "being made solid with the" should be changed to "being affixed to the".

Claim 3 is objected to because of the following informalities: In the first line, "second comparator with threshold for comparing" should be changed to "second comparator for comparing" or "second comparator with a threshold for comparing".

Claim 4 is objected to because of the following informalities: In the second line of the claim "at least" should be deleted. In addition, in that same line, the phrase "the gravity" lacks antecedent basis in the claim. This could be corrected simply by deleting the word "the".

Claims 9 and 16 are objected to because of the following informalities: The wording "according to a method known as error gradient descent" should be shortened to "according to an error gradient descent method".

Claim 13 is objected to as lacking antecedent basis. "Rating the registration" lacks antecedent basis in this claim.

Claim 17 is objected to because of the following informalities: In the first line of the claim, the words "of the" or "between the" should be inserted between the words "confrontation" and "test".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-2, 4-5, 7-8, 11-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Abe (US pat 6,636,826).

With respect to claim 1, Abe discloses a device comprising:

1) At least a sensor of angular position, capable of being made solid with the solid (fig 5) and of supplying at least a measuring datum representative of the orientation of the solid (Fig 3 items 401-404).

2) Means for generating test data representative of an estimated orientation of the solid (Fig 3 item 50 and 80).

3) Means for modification of the estimated orientation of the solid by confrontation of the measuring datum and test data (Fig 3 item 60).

With respect to claim 2, Abe discloses that the modification means of the estimated orientation comprise a first comparator connected to the sensor and to the means for generating test data, for receiving the measuring datum and at least a test datum, and for establishing at least a difference between the test datum and the measuring datum (column 3 lines 28-31).

With respect to claim 4, Abe discloses that the device comprise at least an angular position sensor sensitive to the gravity and at least an angular position sensor sensitive to a magnetic field (Fig 3 items 401-404).

With respect to claim 5, Abe discloses the sensor sensitive to gravity comprises at least an accelerometer and the sensor sensitive to a magnetic field comprises at least a magnetometer (Fig 3 items 401-404).

With respect to claim 7, Abe discloses that the means for generating test data comprise a calculator for calculating test data as a function of an estimated orientation, and as a function of parameters characteristic of a response of the angular position sensor (column 3 lines 22-30).

With respect to claim 8, Abe discloses that the calculator is localized on the solid (Fig 5 item 20).

With respect to claim 11, Abe discloses a motion capture device of the rotation of a solid comprising a capture device of the orientation (Fig 3) and means for registering a successive estimations of the orientation of the solid (column 3 lines 60-65).

With respect to claim 12, Abe discloses that the means for registering are localized on the solid (Fig 5 item 20).

With respect to claim 13, Abe discloses a timer for rating the registration of the successive estimations of the orientation of the solid (Fig 3 items 310 and 60). It is well known that digital processors operate with a timer clock. The application of the device by Abe in a virtual reality headset would necessitate that the timer be used for tracking motion.

Claims 1and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Donahue (US pat 5,526,022).

With respect to claim 1, Donahue discloses a device comprising:

1) At least a sensor of angular position, capable of being made solid with the solid and of supplying at least a measuring datum representative of the orientation of the solid (Fig 1 items 20 and 22).

2) Means for generating test data representative of an estimated orientation of the solid (column 2 lines 56-63).

3) Means for modification of the estimated orientation of the solid by confrontation of the measuring datum and test data (column 2 lines 56-63).

With respect to claim 6, Donahue teaches two sensors each having three axes of sensitivity (Fig 1 items 20 and 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 3, 9-10, 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe in view of Keeler (US pat 5,682,317).

With respect to claim 3, Abe discloses an estimated orientation.

Abe fails to disclose comparing said estimated orientation to a threshold and validating it based on said comparison.

Keeler teaches a second comparator with threshold for comparing the difference established by the first comparator to a threshold value and to validate the estimated orientation, when the difference established by the first comparator is less than the threshold value (Fig 1a item 37 and column 2 lines 32-37).

It would have been obvious to one of ordinary skill in the art to check the validity of the correction value of Abe by comparing it to a threshold as does Keeler. This could be accomplished in the processing calculator of Abe in order to detect and avoid possibly erroneous measurements.

With respect to claim 9, Abe discloses a calculator for generating test data and establishing new estimated orientations.

Abe fails to disclose using error gradient descent.

Keeler teaches that the modification means of the estimated orientation and/or the means for generating a test datum comprise a calculator for establishing a new estimated orientation and/or a new test datum according to a method known as error gradient descent (column 6 lines 31-35).

It would have been obvious to one of ordinary skill in the art to use error gradient descent as does Keeler in the calculator of Abe in order to gradually zero-in on a more precise measurement value. Using gradient descent is well known in the art as a method for parameter estimation.

With respect to claim 10, Abe discloses that the calculator is localized on the solid (Fig 5 item 20).

With respect to claim 14, Abe discloses a method comprising:

a) Capture of measuring data originating from at least one angular position sensor and the establishment of a test datum representative of an estimated orientation of the solid (fig 3 items 401-404).

b) Confrontation of the test datum and the measured datum (Fig 3 item 60).

c) Establishment of a new test datum representative of a new estimated orientation of the solid, corrected as a function of the preceding confrontation (Fig 3 item 60).

Abe fails to teach repeating steps b) and c).

Keeler teaches:

d) Repetition of stages b) and c) (Figs 5a and 12).

It would have been obvious to one of ordinary skill in the art to repeat the steps of Abe multiple times as taught by Keeler in order to continue processing the orientation data towards an acceptable value.

With respect to claim 15, Abe discloses confrontation between a measured and a test datum.

Abe fails to disclose repeated confrontation.

Keeler teaches that the stages are repeated until the confrontation reveals a difference between the test datum and the measuring datum less than a determined threshold (Figs 5a and 12).

It would have been obvious to one of ordinary skill in the art to repeat the comparison of Abe as prescribed by Keeler in order to remove erroneous position estimations and correct the estimations to within a known device tolerance.

With respect to claim 16, Abe fails to disclose using an error gradient method.

Keeler teaches that during stage c), correction calculation is made according to a method known as error gradient descent (column 6 lines 31-35).

It would have been obvious to one of ordinary skill in the art to use error gradient descent as does Keeler in the calculator of Abe in order to gradually zero-in on a more precise measurement value. Using gradient descent is well known in the art as a method for parameter estimation.

With respect to claim 17, Abe discloses a method wherein confrontation test data and the measuring datum comprises the establishment of difference data between successive test data and the measuring datum (column 3 lines 28-31).

With respect to claim 18, Abe discloses that the process is repeated with successive measuring data (column 4 first paragraph). It is the understanding of the examiner that in order for the device of Abe to function (especially in the prescribed application of a virtual reality headset) it must be able to make repeated position measurements.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Foxlin (5,645,077) teaches repeated measurements and correction to measurements in positional sensing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Moffat whose telephone number is (571) 272-2255. The examiner can normally be reached on Mon-Fri, from 7:15-3:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JM

David Gray
Primary Examiner